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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
HARRISON, CHANTE E	

ART UNIT	PAPER NUMBER
2672	7

DATE MAILED: 06/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/944,988	EVERITT ET AL.	
	Examiner	Art Unit	
	Chante Harrison	2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 April 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) *10* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9,11-12,29* is/are rejected.

7)☐ Claim(s) *13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *6*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is responsive to the following communications: Amendment A, filed 4/22/04. This action is made FINAL.

2. Claims 1-9, 11-29 are pending in this application. Claims 1 and 23-29 are independent claims. Claims 1, 15, 23-29 are independent claims and have been amended. Claim 10 has been cancelled.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-12 and 14-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Chauvin et al., U.S. Patent 6,008,820, 12/1999.

As per independent claim 1, Chauvin discloses a method for transparency rendering in a graphics pipeline comprising: a) collecting colored-transparency information from a plurality of depth layers in a scene to be rendered utilizing depth peeling including peeling each portion of a scene in relation to a constraining depth layer (i.e. reading/retrieving image data from memory, where the image data includes

texture data for which pixel data is generated, where the pixel data includes color and alpha data for polygons that are to be rendered) (col. 18, ll. 50-60; col. 19, ll. 10-18; col. 23-24, ll. 64-10; col. 41, ll. 40-60) b) storing the collected colored-transparency information in memory (Fig. 4A) and c) blending the colored-transparency information from the depth layers in a predetermined order (i.e. the display list is sorted in depth order from front to back order) (col. 60, ll. 14-29).

With respect to dependent claim 2, Chauvin discloses the colored-transparency information is collected from at least two depth (col. 4, ll. 15-30).

With respect to dependent claim 3, Chauvin discloses the colored-transparency information is stored in a plurality of texture maps layers (i.e. texture maps are stored as gsprites and have color and alpha data associated with them) (col. 8, ll. 21-28; col. 31, ll. 15-20).

With respect to dependent claim 4, Chauvin discloses the texture maps corresponds with one of the depth layers (abstract; col. 31, ll. 15-20).

With respect to dependent claim 5, Chauvin discloses the texture maps are stored in memory (col. 8-9,ll. 61-5; col. 18, ll. 50-60).

With respect to dependent claim 6, Chauvin discloses rendering opaque objects (i.e. a fixed background) in the scene (col. 4,ll. 15-30).

With respect to dependent claim 7, Chauvin discloses the opaque objects in the scene are rendered prior to blending the colored-transparency information therewith (col. 60,ll. 15-28; col. 39,ll. 44-52).

With respect to dependent claim 8, Chauvin discloses the memory includes a frame buffer (col. 8-9,ll. 60-5).

With respect to dependent claim 9, Chauvin discloses blending includes linear blending (i.e. linear equations are used to determine interpolation across the surface when rendering) (col. 18, ll. 27-34).

With respect to dependent claim 10, Chauvin discloses the colored-transparency information is collected utilizing depth peeling (i.e. texture data is used to retrieve a shadow depth map) (col. 22, ll. 2-12).

With respect to dependent claim 11, Chauvin discloses depth peeling includes executing a first rendering pass for collecting colored-transparency information relating to a first depth layer . . . collecting . . . information relating to additional depth layers (i.e.

texture data read and used in multi-pass rendering operations) (col. 18, ll. 50-60; col. 19,ll. 10-18).

With respect to dependent claim 12, Chauvin discloses the first rendering pass produces a shadow map relating to the first depth layer (i.e. multi-pass rendering operations performed per pixel/primitive having an associated depth generates a shadow map) (col. 18, ll. 50-60).

With respect to dependent claim 14, Chauvin discloses additional rendering passes are taken from the same eye position from which the first rendering pass is taken (Fig. 5A).

With respect to dependent claim 15, Chauvin discloses information is collected utilizing depth peeling including a first rendering pass for generating a shadow map from which first colored-transparency information . . . is collected . . . (i.e. texture data is used to retrieve a shadow depth map) (col. 22, ll. 2-12), executing additional rendering passes . . . from the same eye position (i.e. viewpoint is initially determined followed by processing/rendering of multiple sprites) (Fig. 5A).

With respect to dependent claim 16, Chauvin discloses information relating to the additional depth layers is collected by removing a portion of the scene . . . (col. 41, ll. 25-58).

With respect to dependent claim 17, Chauvin discloses additional depth layers is collected by performing a test to determine which portion of the scene to remove (col. 41, ll. 25-58).

With respect to dependent claim 18, Chauvin discloses the test determines whether the portion of the scene is behind the previous depth layer (col. 42, ll. 30-60).

With respect to dependent claim 19, Chauvin discloses portion of the scene is removed upon the test determining that the portion of the scene is behind the previous depth layer (i.e. non-overlapping image data is culled away) (col. 41,ll. 52-60).

With respect to dependent claim 20, Chauvin discloses the test calculates a difference between a previous z-value relating to the previous depth layer and a present z-value . . . (i.e. occlusion test) (col. 41, ll. 52-60).

With respect to dependent claim 21, Chauvin discloses the portion of the scene is removed upon no difference being calculated . . .(i.e. image space recursive subdivision) (col. 41, ll. 40-51).

With respect to dependent claim 22, Chauvin discloses the z-values relating to all depth layers are produced with the same interpolation-related method for improving an accuracy of the test (col.19, ll. 5-10).

As per independent claim 23, Chauvin discloses a computer program product . . . (col. 7,ll. 30-41) for implementing the method of claim 1. Therefore the rationale applied in the rejection of claim 1 applies herein.

As per independent claim 24, Chauvin discloses a system for transparency rendering . . . comprising: a) logic for collecting . . . information . . . utilizing depth peeling including peeling each portion of a scene in relation to a constraining depth layer (Fig. 3 & 5A; col. 18, ll. 50-60; col. 19, ll. 10-18; col. 23-24, ll. 64-10; col. 41, ll. 40-60); b) memory for storing . . . information (Fig. 4A); and c) a renderer coupled to the memory for blending the . . . information from the depth layers in a predetermined order (i.e. the display list is sorted in depth order from front to back order) (Fig. 4A & 21A; col. 60, ll. 14-29).

As per independent claim 25, Chauvin discloses a system for transparency rendering . . . comprising: a) logic for collecting . . . information . . . utilizing depth peeling including peeling each portion of a scene in relation to a constraining depth layer (i.e. texture data is used to retrieve a shadow depth map and progressively culling geometry utilizing a depth based traversal order) (Fig. 3 & 5A; col. 18,ll. 50-60; col. 19,

ll. 10-18; col. 23-24, ll. 64-10; col. 41, ll. 40-60); b) memory for storing . . . information (Fig. 4A); and c) register combiners coupled to the memory for blending the . . . information from the depth layers in a predetermined order (i.e. the display list is sorted in depth order from front to back order) (Fig. 4A & 21A; col. 60, ll. 14-29).

As per independent claim 26, Chauvin discloses a method for transparency rendering . . . comprising: a) collecting colored-transparency information . . . utilizing depth peeling including peeling each portion of a scene in relation to a constraining depth layer (i.e. texture data is used to retrieve a shadow depth map and progressively culling geometry utilizing a depth based traversal order) (Fig. 3 & 5A; col. 18, ll. 50-60; col. 19, ll. 10-18; col. 23-24, ll. 64-10; col. 41, ll. 40-60); b) storing the collected color-transparency information in the form of a plurality of texture maps (i.e. texture maps are stored as gsprites and have color and alpha data associated with them) (col. 8, ll. 49-54; col. 31, ll. 45-50); c) rendering the opaque objects in the scene (col. 39, ll. 45-52); d) storing the rendering of the opaque objects in memory (col. 50,ll. 17-22; col. 51, ll. 15-19; col. 5, ll. 10-30); e) identifying one of the depth layers to be blended (col. 50, ll. 42-65); f) blending . . . from the identified depth layer . . . (col. 51, ll. 15-19); g) storing the results of f) in memory; and h) repeating acts e)-g) (col. 5, ll. 10-30; col. 51, ll. 35-67).

As per independent claim 27, Chauvin discloses a computer program product . . . (col. 7,ll. 30-41) for implementing the method of claim 26. Therefore the rationale applied in the rejection of claim 26 applies herein.

As per independent claim 28, Chauvin discloses a method for transparency rendering . . . comprising: a) collecting colored-transparency information . . . utilizing depth peeling including peeling each portion of a scene in relation to a constraining depth layer (col. 18,ll. 50-60; col. 19, ll. 10-18; col. 23-24, ll. 64-10; col. 41, ll. 40-60) by: I) executing a first rendering pass for generating a shadow map . . . relating to a first depth layer (col. 19 ll. 12-20, 50-52), and ii) executing additional rendering passes with a shadow-mapping feature enabled and from the same eye position . . . relating to additional depth layers (i.e. viewpoint is initially determined followed by processing/rendering of multiple sprites) (col. 22, ll. 30-40; Fig. 5A); b) storing the collected colored-transparency information in memory (Fig. 4A); and c) blending the colored-transparency information from the depth layers (i.e. the display list is sorted in depth order from front to back order) (col.50, ll. 15-30).

As per independent claim 29, Chauvin discloses a computer program product . . . (col. 7,ll. 30-41) for implementing the method of claim 28. Therefore the rationale applied in the rejection of claim 28 applies herein.

Allowable Subject Matter

3. Claim 13 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

4. Applicant's arguments filed 4/22/04 have been fully considered but they are not persuasive.

Applicant argues (pp. 8), Chauvin fails to disclose collecting colored-transparency information from a plurality of depth layers in a scene to be rendered utilizing depth peeling.

In reply, Applicant's specification pp.13-14, ll. 5-11, references receipt/collection of image data (i.e. receiving a scene), where the scene may be a texture map and during a rendering pass receiving a depth layer in the form of shadow map, which includes collection of image enhancement data (i.e. color/transparency). Chauvin discloses receiving texture data (i.e. color data) (col. 21-22, ll. 65-2), and using the texture data to retrieve a shadow depth map (i.e. depth layer information) during multi-pass operations (col. 22, ll. 3-11). Chauvin additionally teaches that the rasterization process (i.e. rendering pass) determines the depth layer information (i.e. z-value, color, etc.) for access to and determination of the contribution of the data to pixel color and alpha values (col. 23-24, ll. 64-10), which corresponds to determining the portion of the scene relative to a constrained/particular depth layer. Chauvin also discloses chunking scheme that progressively culls/removes geometry (col. 41, ll. 40-60).

Applicant argues (pp. 9) Chauvin teaches away from the applicant's claimed "peeling each portion of a scene", which utilizes more memory by disclosing variable sized images for individual objects that the hardware attempts to reuse from frame to frame.

In reply, Chauvin's is interpreted as teaching the applicant's invention as he discloses processing variable sized image portions that reside on image layers/gsprites using a chunking scheme that progressively culls/removes geometry utilizing a depth based traversal order (col. 41, ll. 40-60).

Applicant argues (pp. 10 & 11), Chauvin fails to disclose collecting colored-transparency information for a first depth layer during a first rendering pass and collecting additional color information for additional depth layers during additional rendering passes.

In reply, Chauvin teaches retrieving texture (i.e. color-transparency information) for shadow maps (i.e. depth layers) using multi-pass rendering operations (col. 18, ll. 50-64).

Applicant argues (pp. 10), Chauvin fails to disclose the first rendering pass produces a shadow map relating to a first depth layer.

In reply, Chauvin discloses the rasterization process (i.e. rendering pass) determines the depth layer information (i.e. z-value, color, etc.) for access to and

determination of the contribution of the data to pixel color and alpha values (col. 23-24, ll. 64-10).

Applicant argues (pp. 10), Chauvin fails to disclose a shadow-mapping feature is enabled during the additional rendering passes for defining a previous depth layer

In reply, Examiner agrees this feature is not specifically disclosed by the prior art.

Applicant argues (pp. 11), Chauvin fails to disclose executing additional rendering passes from the same eye position.

In reply, Chauvin teaches processing data within a view volume (col. 13-14, ll. 65-7).

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chante Harrison whose telephone number is 703-305-3937. The examiner can normally be reached on Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Razavi can be reached on 703-305-4713. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chante Harrison
Examiner
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ceh

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